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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/541,289	06/30/2005	Xiaoyang Rong	60680-985	6288
26127	7590	06/01/2006	EXAMINER	
DYKEMA GOSSETT PLLC 39577 WOODWARD AVENUE SUITE 300 BLOOMFIELD HILLS, MI 48304-5086			HANDAL, KAITLY V	
			ART UNIT	PAPER NUMBER
			1764	

DATE MAILED: 06/01/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/541,289

Applicant(s)

RONG ET AL.

Examiner

Kaity Handal

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☐ Claim(s) ____ is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 71-78 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 6/30/2005
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: ____

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claim 71-78 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 71 recites the limitation "said gaseous mixture" in lines 16-17. There is insufficient antecedent basis for this limitation in the claim.

Claims 77-78 recite the limitation a continuous annular gap between the first and second shell members and wherein the one or more inlet apertures comprises a disconnected joint formed in the sidewall of the first shell member proximate its primary end. It is unclear how the limitations as set forth apply to the respective figures. The outlet apertures meet the limitations but not the inlet apertures. Please clarify or correct.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 71-78 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hotta et al. (US 2005/0129593 A1).

With respect to claims 71-72, Hotta teaches a fuel conversion reactor (fig. 1) comprising: a first heat exchanger section comprising: a first primary shell member/cylindrical heat exchanger (5) having primary (towards the bottom) and secondary ends (towards the top as illustrated) and a sidewall (illustrated) extending between said ends and defining a heat exchanging chamber (around tubes (12)) located within the shell member/cylindrical heat exchanger (5); a first tube sheet (illustrated at the primary end of the shell/cylindrical heat exchanger (5)) fixedly mounted on said primary shell/cylindrical heat exchanger (5) member in the vicinity of said primary end and sealingly closing said heat exchanging chamber (around tubes (12)) at one end of the chamber (illustrated); a second tube sheet device (illustrated in figure below) which is separate from said primary shell member/cylindrical heat exchanger (5) (illustrated) and is located in the vicinity of said secondary end (illustrated), said second tube sheet device forming another end (illustrated) of said chamber that is opposite said one end of the chamber (illustrated); and a plurality of heat exchange tubes (12) extending from said first tube sheet to said second tube sheet device (illustrated) and rigidly connected to both the first tube sheet and the second tube sheet device (illustrated), said heat exchange tubes (12) providing passageways for a gaseous mixture to flow inside the tubes through said heat exchanging chamber (around tubes (12)); wherein one or more outlet apertures/flow port (8) are formed in the region of said secondary end

(as illustrated) of said primary shell member/cylindrical heat exchanger (5) in order to provide at least one outlet (illustrated by arrows) for said gaseous fluid which flows through said heat exchanging chamber (around tubes (12)) on a shell-side thereof during operation of said fuel conversion reactor; and an inlet aperture (7a) in the primary end of the for introducing said gaseous fluid into said first heat exchanging chamber (around tubes (12)).

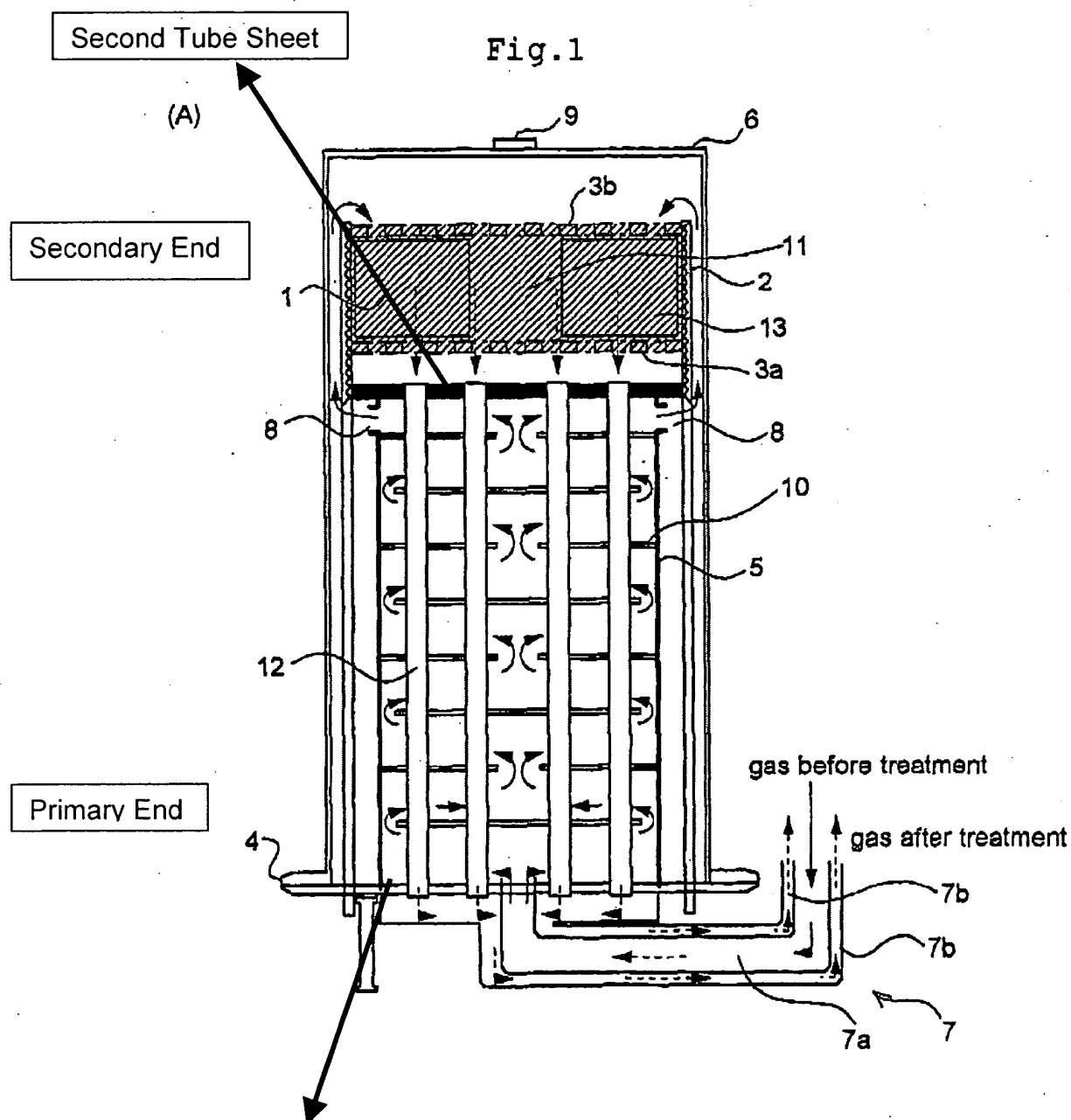
Hotta fails to teach a second heat exchanger having a second shell member that is concentric/coaxial with said first primary shell member with the primary end of the first shell member being located proximate the secondary end of the secondary shell member and having a similar structure to the first heat exchanger.

Limitations recited in claims 71-72 pertaining to the second heat exchange chamber are mere duplication of parts: *In re Harza*, 274 F.2d 669, 124 USPQ 378 (CCPA 1960). It has been held that mere duplication of parts has no patentable significance unless a new and unexpected result is produced). MPEP 2144.06B.

With respect to claims 73-74, Hotta teaches an outer shell (6) having first and second ends and extending around said primary end of the first shell member/cylindrical heat exchanger (5) and wherein a fuel passageway is formed between said outer shell (6) wall and said sidewall of the primary shell member/cylindrical heat exchanger (5). Said outer shell surrounding the secondary end of the second shell member and a passageway for flow of the gaseous fluid from the second heat exchanger to the first heat exchanger would naturally exist as part of duplicating and including a second heat exchanger. Limitations recited in

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claims 73-74 pertaining to the second heat exchange chamber are mere duplication of parts: *In re Harza*, 274 F.2d 669, 124 USPQ 378 (CCPA 1960). It has been held that mere duplication of parts has no patentable significance unless a new and unexpected result is produced). MPEP 2144.06B.



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With respect to claim 75, Hotta teaches wherein said one or more outlet aperture First Tube Sheet formed at said secondary end (towards the top as illustrated) of said primary shell member /cylindrical heat exchanger (5) and comprises a disconnected joint (as illustrated) between the first and second shell members. One or more outlet apertures would be at the end of the second shell member and comprising a disconnected joint between the first and second shell members as a duplicate heat exchange chamber is added.

With respect to claim 76, Hotta fails to show wherein the primary end of the first shell member is of a greater diameter than the secondary end of the second shell member and wherein the secondary end of the second shell member is received inside the primary end of the first shell member, and wherein the primary end of the first shell member is rigidly attached to the sidewall of the second shell member such that a passageway for flow of the gaseous fluid from the second to the first heat exchanging chamber is formed between the first and second shell members. It has been held that a person of ordinary skill in the art would find it obvious to modify a known device so as to provide mating surfaces when joining elements together. In re Dailey, 149 USPQ 47 (CCPA 1976).

With respect to claims 77-78, Hotta discloses all claim limitations as set forth above but fails to show wherein said inlet aperture (7a) comprises a continuous annular gap between the first and second shell members and wherein the one or more inlet apertures comprises a disconnected joint formed in the sidewall of the first shell member proximate its primary end. As part of duplicating parts and adding a

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second heat exchanging chamber, one skilled in the art would shift the location of inlet (7a) of Hotta's apparatus to the side such that reactants are introduced to the heat exchanging chamber, thereby forming a continuous annular gap between the first and second shell members and wherein the one or more inlet apertures comprises a disconnected joint formed in the sidewall of the first shell member proximate its primary end.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kaity Handal whose telephone number is (571) 272-8520. The examiner can normally be reached on M-F 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn Caldarola can be reached on (571) 272-1444. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Glenn Caldarola
Supervisory Patent Examiner
Technology Center 1700

5/15/2006